

DESCRIPTION OF THE COURSES

- Course code: ELR2361
- Course title: Electrical devices
- Language of the lecturer: Polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	2	0	2	1	0
<i>Number of hours/semester*</i>	20	0	20	10	0
<i>Form of the course completion</i>	Exam		completion of laboratory exercises	completion of the project task	
<i>ECTS credits</i>	6		2	1	
<i>Total Student's Workload</i>	180		60	30	

- Level of the course (basic/advanced): basic
- Prerequisites: Basics of electrotechnique 1, Mathematical analysis 1
- Name, first name and degree of the lecturer/supervisor:
prof. Zbigniew Wróblewski, PhD, DSc
- Names, first names and degrees of the team's members:
prof. Henryk Markiewicz, PhD, DSc
Antoni Klajn, PhD
Kazimierz Herlender, PhD
Waldemar Dołęga, PhD
Mirosław Kobusiński, MSc
- Year:..3..... Semester:..5.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):
Understanding of the physical phenomena in electrical equipment. Understanding of the function of different devices in the operation of power electrical network and installations. Know-how of the basic parameters of electrical devices and principles of designing. Understanding of relations between construction and reliability as well as effectiveness of devices.
- Form of the teaching (traditional/e-learning): traditional
- Course description:
Electrical devices in production, transmission, distribution and consuming of the electrical energy. Standardisation and typification of equipment. Environmental conditions of operation of electrical devices. Short-circuits in power electrical systems. Electromagnetic, thermal and dynamical effects. Electrical switching arc and switching phenomena in electrical circuits. Over-voltages in electrical devices and its limitation. LV and HV switches. Supplying networks and elements of LV electrical installations. Principles of designing of electrical installations. Power transformers and measuring transformers. Short-circuit current limitation.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. Basic definitions, notions and rated parameters of electrical equipment. Standardisation and typification. Environmental conditions of operation of electrical devices and its classification. Protection of electrical devices against environmental stress.	2
2. Short-circuits in power electrical networks. Fault current flows. Parameters of short-circuit elements and replace schemas of these circuits.	2
3. Thermal and electro-dynamical effects of operation and fault currents in electrical devices. Exemplary calculations.	2
4. Classification of over-voltages in power electric networks. Over-voltage protection in low-voltage and high voltage networks. Switching phenomena in electrical networks and typical examples of switching over-voltages.	2
5. Electrical switching arc and principles of its extinguishing in DC and AC switching apparatus. Classification of electrical low-voltage switches.	2
6. LV switches.	2
7. Switchgears and basic elements of electrical installations. Power electrical conductors and principles of its design in electrical installations.	2
8. HV switching apparatus.	2
9. power transformers and its operation. Current and voltage measuring transformers	2
10. Fault current limitation in power electrical networks, current-limiting reactors. HV switchgears. HV switchgear installations.	2

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:

1. Introductory lecture.	2
2. Operating and short-circuit load of conductors.	2
3. Resistance of electrical contacts.	2
4. Electrical arc in DC and AC circuits.	2
5. Lighting technique and electrical light sources.	2
6. Choosing of over-current protection of low-voltage motors.	2
7. Testing of low-voltage power circuit breakers.	2
8. Contactor-control circuits of electrical motors.	2
9. Low-voltage switchgears.	2
10. Completion of laboratory.	2

- Project – the contents:

Realisation of the project task in the field of designing an industrial electrical installation.

- Basic literature:
 1. Markiewicz H. Urządzenia elektroenergetyczne. WNT, Warszawa 2005
 2. Markiewicz H.: Instalacje elektryczne. WNT, Warszawa 2006
- Additional literature:
 1. Maksymiuk J.: Aparaty elektryczne, WNT, Warszawa 1995
 2. Poradnik inżyniera elektryka, Tom 2 i 3, WNT, Warszawa 1996
- Conditions of the course acceptance/creditation:

Completion of the examination, laboratory practice and the project task

* - depending on a system of studies